SmartCatch Systems

Putting Intelligence into Surveillance

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Smart Surveillance: Features & Benefits

- Video intelligence software that detects, identifies and tracks objects within existing CCTV systems
  - Monitors events in real time to insure activities are limited to specific tasks & within authorized areas of authority
  - Automatically detects suspicious behaviors and other violations of established security policies and procedures
  - Distinguishes between objects: person(s), bag(s), vehicles, etc.
  - Sounds alerts & alarms according to user escalation procedures
  - Supports incident analysis and forensic search (in real time or via preserved archives)
  - Maintains confidentiality through restricted user and role based access

The New Face of Physical Security

Then

- Reliance upon semi-skilled guards with 90-100% turnover and whose costs exceeds that of products & systems
- A highly fragmented, unstable industry
- Products typically passive, standalone sensors
- Thinking in terms of borders, fences & doors

New Focus

- Reduce people cost with smart technology
- Integrate systems with advanced surveillance technology
- Prevent actions of those who pose a threat while facilitating actions of the honest majority
- Elevate operational effectiveness & efficiency
- Deploy human-centric framework that can associate actions with identity, behavior and credentials

Human Costs of Security

Total Security Market

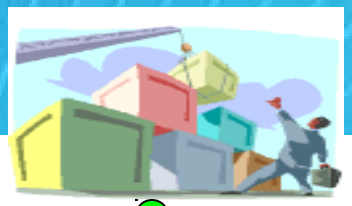
Guard Cost

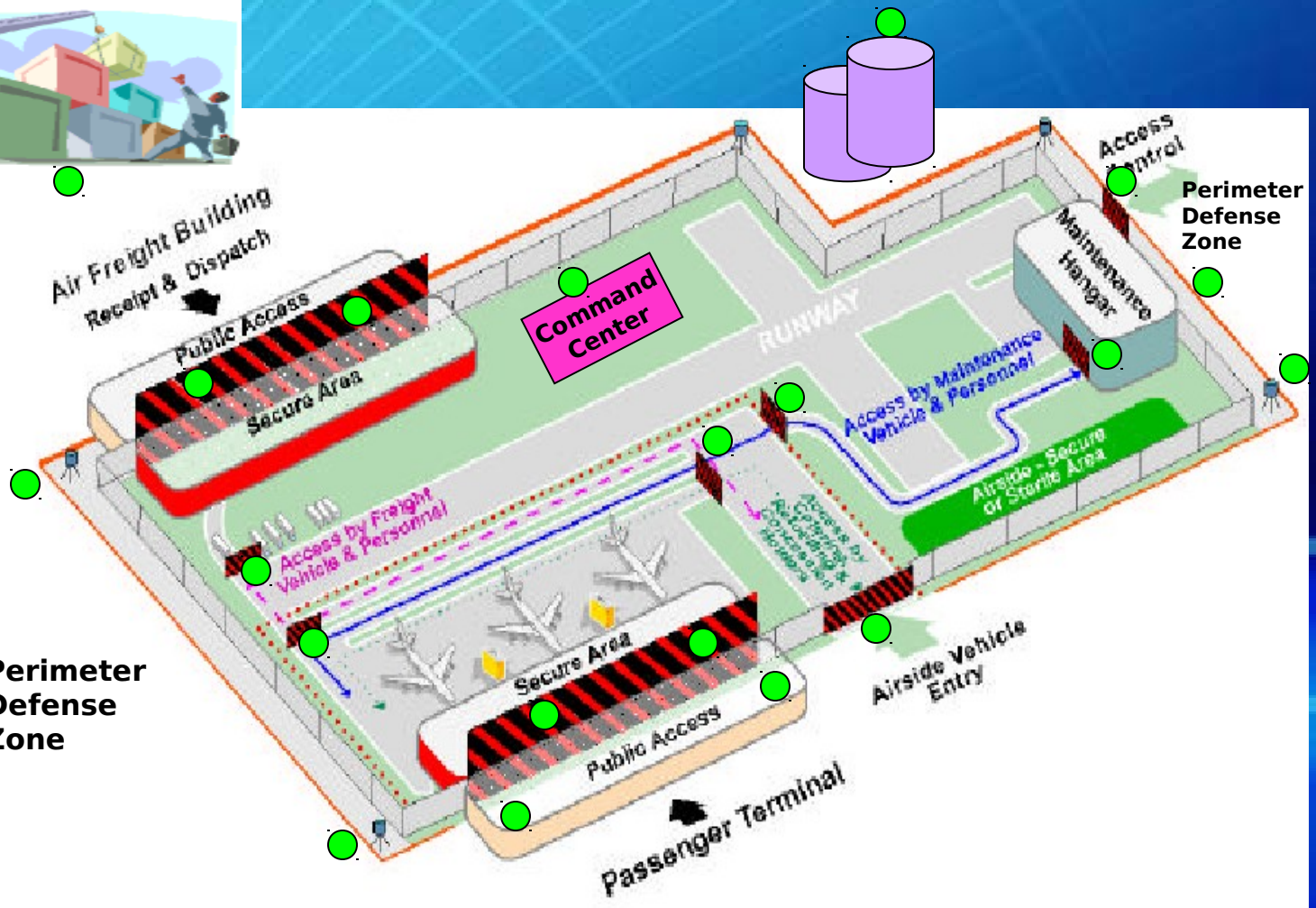
(staff one post, 24/7 at one facility)

Position	Staff		Annual Salary		Annual Cost
Security Guard	5	X	$26,628	=	$133,140
Security Director	1	X	$64,133	=	$64,133
Your Current Costs					$197,273

Source : JP Freeman, GE, Security magazine, OnGuard.

Typical Airport Model



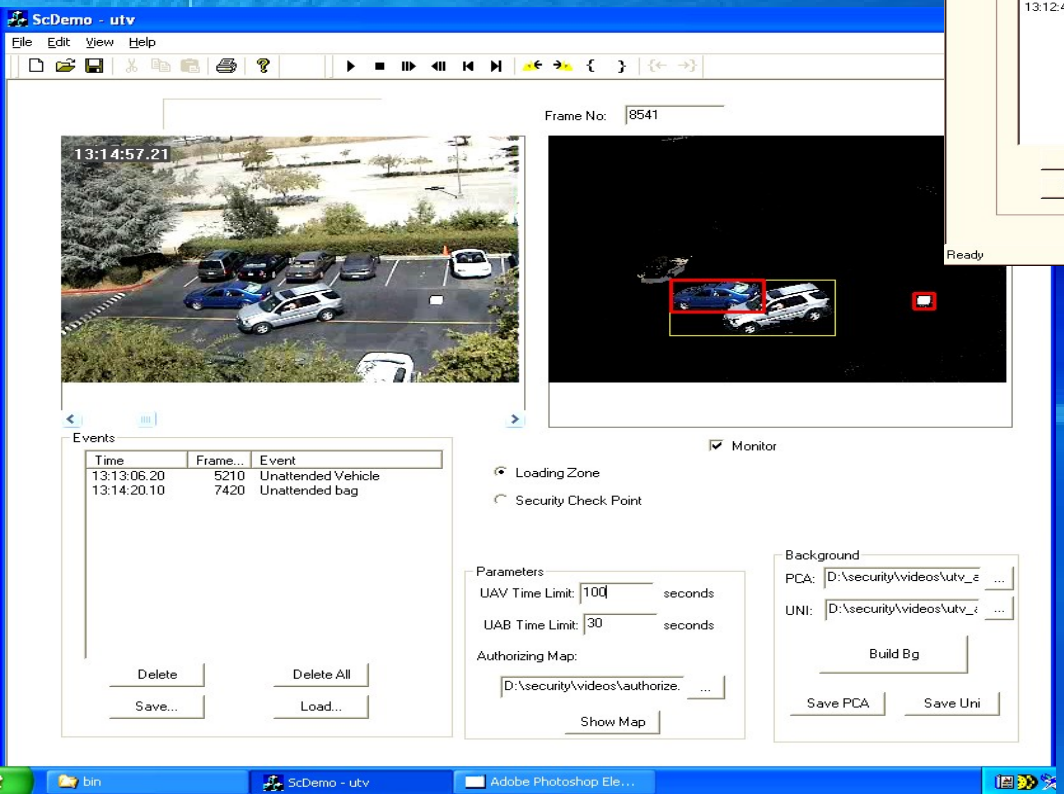


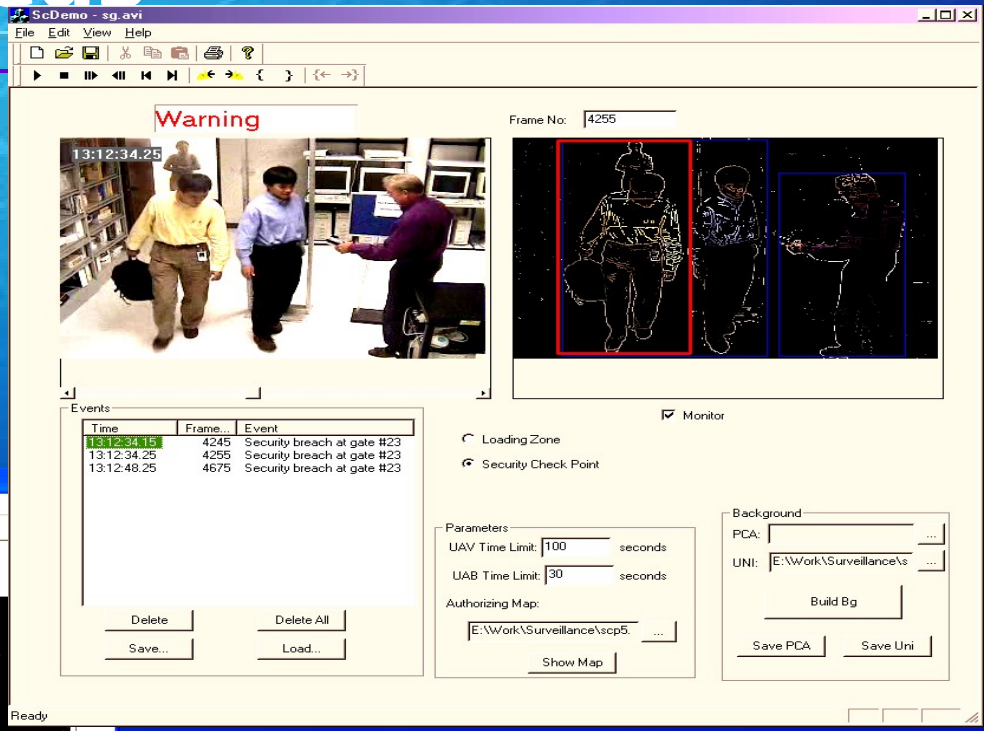
Airport Examples

- Unattended baggage
  - PanAm Lockerbie disaster: Heathrow Airport
- Unidentified person walks around the security gate
  - Denver Airport, August 2002
- Unidentified person in unauthorized AOA
  - Detroit Metro Airport , May 2002
- Piggybacking/Tailgating at secure access points
- Failure to recognize unattended vehicles
  - Louisville Intl. Airport, Sept 2001
- Unidentified person gains access to the runway and stows away
  - Logan International Airport, Sept 1999
- Unidentified person disappears in the parking lot
- Suspicious movement against normal traffic patterns

Application areas

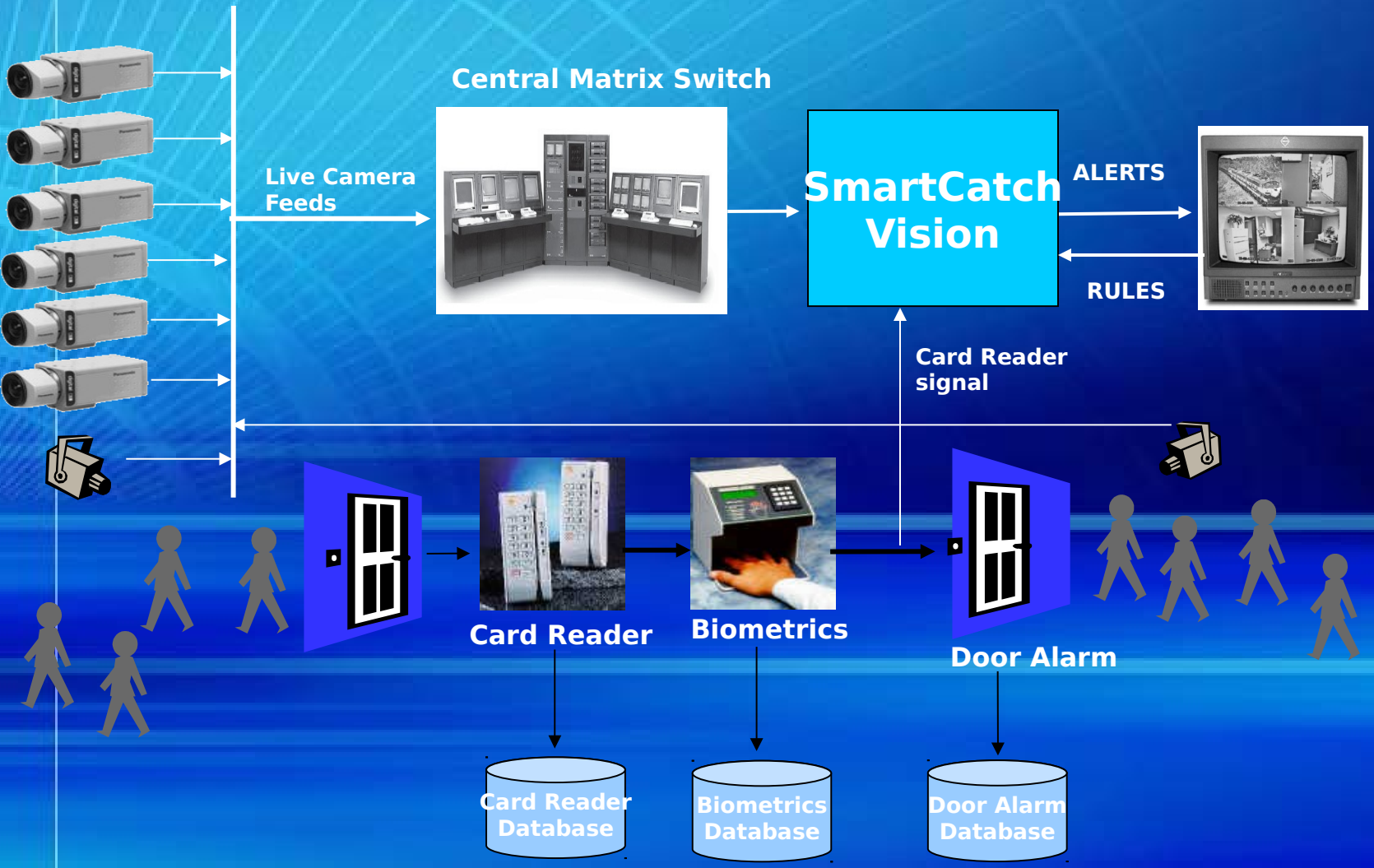
Perimeter Monitoring





Security Checkpoint Monitoring

System Overview

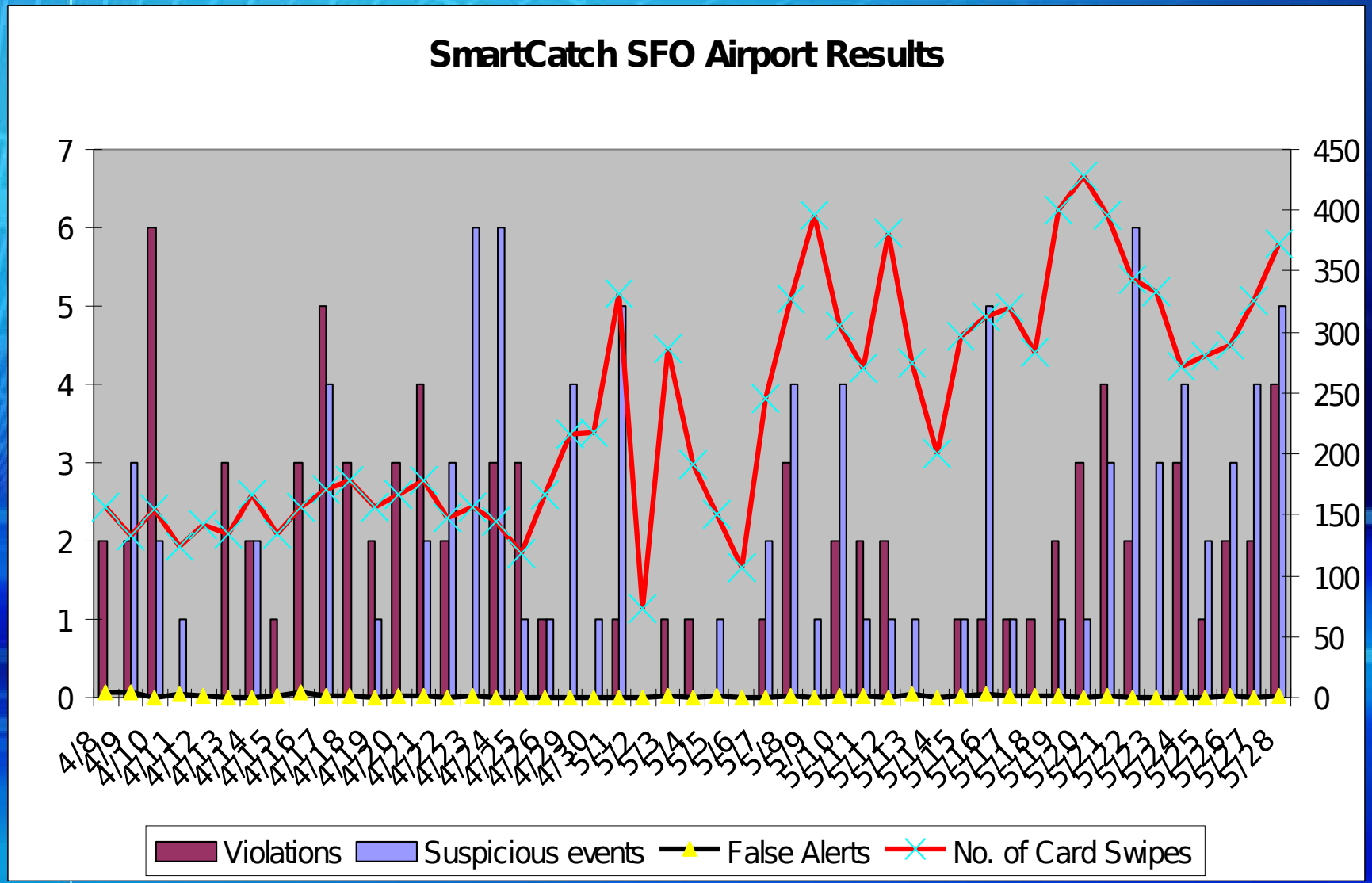


SFO requirements

- Detect tailgating: more than one person enters the door with one card swipe.
- Detect piggybacking: one person swipes the card and another person enters the door.
- Detect abnormal behaviors:
  - Person swiping the card many times.
  - Person loitering in front of the door.

Output from SFO

SFO Airport Results



SmartCatch Algorithms

Backgrou
nd
modeling

Card reader
Palm reader

Object
detecti
on

Motion
detection

Object
trackin
g

**Event
detectio
n**

SmartCatch Differentiators

Limitations of the current systems

- Difficulties of human tracking: non-rigid motion, changing image size, occlusion and intersections
- Unable to handle changing shape in relation to camera angle
- Generates very high false alerts
- Cannot handle cluttered environment with multiple objects

SmartCatch Approach

- Neural Network that handles both humans and non-humans in cluttered envionrments
- Tight Integration of Object detection & tracking resulting in very high system accuracy
- Robust object classification engine
- Background modeling that automatically adjusts to changing lighting conditions
- Real-time processing speed

SmartCatch: Benefits

- Provides a quantifiable increase in security
- Increases public/employee confidence
- Provides 24x7 protection without delays or inconvenience to customers or employees
- Reduces risks of liability
- Increases operational efficiency